Opening the black box

Opening the Black Box: A Mixed-Methods Investigation of Social and Psychological Mechanisms Underlying Changes in Financial Behaviour

Abstract

We use a mixed-methods approach to open the "black box" of a combined financial literacy and parenting intervention to elucidate the key mechanisms through which changes in financial behaviour are realised. Drawing on qualitative data from 16 focus groups and 42 in-depth interviews, we find evidence for three pathways of change. Higher confidence in financial management skills, a more optimistic future outlook and emotional support provided by peers and family members are described as key facilitators of improved financial behaviour. These mechanisms are cross-validated in subsequent quantitative analyses based on standardised interviews from a randomised controlled trial with 552 households. A mediation analysis indicates that the programme's effect on financial behaviour is significantly mediated by financial self-efficacy (24% of total effect) and optimism (22% of total effect). We further show that the psychological factors are significantly reinforced by increased levels of social support in the family and wider community. Mediating variables remain robust in sensitivity analyses and are confirmed as significant paths when entered simultaneously into a structural equation path model. Our findings highlight possible target points for financial literacy interventions and motivate the inclusion of psychosocial programme components.

I. Introduction

Quantitative experimental research to date has largely focused on establishing causal estimates of a programme's main impact. However, critics argue that this "black box view" fails to answer the important questions of *why* and *how* a programme works (Deaton, 2010a, 2010b; Brady & Collier, 2004; Harrison, 2011). Moving beyond the examination of average treatment effects can enable researchers to explain and understand null effects or identify the key "ingredients" of a successful curriculum (Nguyen et al., 2015; MacKinnon et al., 2006). Elucidating the key mechanisms of change can thus provide vital insights for the design of future programmes.

Against this backdrop, we aim to open the "black box" of a group-based parenting and financial literacy programme that was delivered to 552 poor families in the Eastern Cape province of South Africa. In a recent publication in the *Journal of Development Economics*, we presented results from a randomised impact evaluation of the programme and documented substantial changes in participants' financial behaviour as well as downstream impacts on economic welfare indicators (see omitted to maintain author anonymity). In this paper, we extend on our previous analysis to shed light on the mechanisms through which these changes in financial behaviour were realised.

A growing body of literature has argued that financial behaviour is not only a function of economic scarcity, financial knowledge, and available infrastructure, but that it is also shaped by psychological and social factors (Blattman et al., 2017; Heller et al., 2017; Campos et al., 2017; Borghans, Duckworth, Heckman & Weel, 2008). Following this, we developed a parenting and financial literacy programme with a curriculum that aimed to simultaneously strengthen economic, psychological, and social skills.

Theoretical literature points to three distinct psychological determinants of financial behaviour. First, the concept of **self-efficacy** has a long-standing tradition in social cognitive theory and is viewed as the central link between a person's behavioural intentions and actions (Fishbein & Yzer, 2003; Bandura, 1986, 1982). Self-efficacy thereby refers to the confidence and beliefs that a person holds about his or her ability to perform a certain behaviour. Accordingly, it defines the extent to which a person can

follow through with a goal, execute perseverance, and adhere to plans (Esopo et al., 2018). Conversely, low self-efficacy can impose constraints on the perceived level of control over behaviours and thus impede action, for instance, the decision to save money or make investments for potentially profitable purpose. Indeed, empirical studies have revealed significant correlations between self-efficacy and financial behaviours such as retirement savings or portfolio investments (Chatterjee et al., 2011; Dietz et al., 2003). More recent empirical evidence has also suggested that self-efficacy is not a static trait but is in fact *malleable* and can thus be turned into an important target point for programme designs. For example, interventions have sought to foster participants' confidence, promote positive self-images, and reshape self-defeating narratives, thus facilitating improvements in participants' future-oriented savings choices or income generation activities (McKelway, 2018; Ghosal et al., 2015).

A second influential psychological aspect is **optimism** (or hope), which arguably is associated with the idea and vision that a person holds about the future. If a person's mental models are dominated by hopelessness and fatalistic ideation, he or she may *"rationally decide to hold back his or her efforts, avoid investment, and thus achieve even less than he or she could otherwise have attained"* (p.32) (Duflo, 2012). That is, the lack of optimism and hope can have direct negative economic consequences (World Development Report, 2015). To promote optimism and mitigate internalised constraints, a range of previous interventions have capitalised on the use of role models to convey narratives of success and achievements (Nguyen, 2008). Scholars thereby argue that the success stories of movie characters (who are perceived as peers) may lead to a 'vicarious experience', which helps participants to shift their mental models from negative expectations to a more optimistic view of the future (Riley, 2018; Bernard et al., 2014).

A third psychological factor is what scholars have summarised under the terms **self-control** or "grit" (Alan et al., 2016). Limited self-control has been linked to financial behaviours such as overconsumption, overborrowing, and temptation spending, all of which may negatively impact economic outcomes (World Development Report, 2015; Karlan et al., 2014; Borghans et al., 2008). A prominent manifestation of limited self-control is present bias, which denotes the tendency to overweigh the present relative to the future, namely a preference for smaller immediate rewards over larger rewards that lie further in the future (Hardcastle, 2012; Benabou & Tirole, 2004). Consequently, if a

person suffers from present bias s/he is more likely to opt for short-term gratification and discard future-oriented planning such as accumulating precautionary savings or putting aside money for the end of the month (Haushofer & Fehr, 2014; Hardcastle, 2012). Building on this, a range of recent empirical studies have established strong evidence suggesting that promoting self-control skills, for instance through cognitive behavioural therapy or commitment instruments, can have positive impacts on a range of economic outcomes (Heller et al., 2017; Blattman et al., 2017; Benabou & Tirole, 2004).

In addition to these psychological aspects, theoretical literature has highlighted associations between social factors and financial behaviour, mainly via two channels. A first 'network channel' can reinforce positive financial behaviours through information sharing, the provision of moral support, and social learning cascades (Kast et al., 2012). According to behavioural theory, social learning promotes information cascades and "herding effects" that tend to generate uniform behaviour among members of a group (see Baddeley, 2013). That is, if one person in a social network starts to save money, the likelihood that other network members take up saving is increased. A second 'peer pressure channel' penalises behaviour that deviates from an endorsed social norm via a reputation tax (Breza & Chandrasekhar, 2019; Battaglini et al., 2017). Empirical work has established strong links between such peer effects and increases in savings (Breza & Chandrasekhar, 2019; Doi et a., 2014; Duflo & Saez, 2000), uptake of insurance schemes (Cai et al., 2015), and participation in stock markets (Hong et al., 2004).

In this paper, we apply a mixed-methods approach to examine whether similar psychological and social aspects explain the improvements in financial behaviour that we observe among our programme participants. Precisely, we will use insights from the qualitative data analysis to indicate potential pathways and directions of effects. These are then further explored quantitatively via mediation analyses and structural equation modelling (Imai et al., 2010a, Kline, 2010).

The paper proceeds as follows: the next section introduces the trial design and the methodology used for the identification and testing of mediating pathways. The third section provides background on the study sample and then presents findings from the

qualitative and subsequent quantitative analyses. The last section situates the findings within the wider research literature, discusses limitations, and concludes.

II. Methods

While our previous publication in the *Journal of Development Economics* made some first tentative attempts to explore potential programme mechanisms, this paper extends our previous analysis by capitalizing on a *Q-squared approach* that combines qualitative and quantitative analysis (Greene, 2008). We apply both a more in-depth analysis of collected qualitative data and a more sophisticated quantitative analysis, including mediation analysis and sensitivity checks as well as structural equation modelling.

Setting

This study was conducted in the Eastern Cape province of South Africa in 32 rural and 8 peri-urban township locations. The Eastern Cape is characterised by high poverty rates (with the lowest GDP nationally), 50% of households without a single employed adult, poor infrastructural development, and an HIV/AIDS prevalence of almost 30% (Statistics South Africa, 2016). In many families, state-provided cash transfers[i] are the only income source, often shared between a large number of household members. Families may thus run out of money before the month's end and fail to secure their subsistence levels.

Participants and Procedures

A total of 552 caregiver-adolescent (10-18 years) pairs were enrolled in a cluster randomised controlled trial of a parenting and financial literacy programme that was delivered by a local NGO (see companion papers by omitted to maintain author anonymity). Recruitment was based on a purposive sampling strategy to identify families at high risk of conflict and deprivation by carrying out door-to-door risk screenings. Quantitative data were collected at baseline and 5-9 months post-intervention. Standardised questionnaires were administered in isiXhosa on mobile devices as audio- and mobile-assisted self-interviews (ACASI) with the intention to maximise confidentiality.

Qualitative data were triangulated. First, focus group discussions were held in eight treatment locations in the week consecutive to the programme's last implementation. For these, caregivers and adolescents were split, with each round lasting around 90 minutes. Discussion guides were designed to elucidate participants' reflections on session content, relationships formed in the group as well as the general impact of the programme on their family and community lives. Each focus group was attended by three 'note takers' responsible for capturing and translating discussion content. Notes and observations were then further discussed and recorded in daily debriefing sessions with the lead author and another senior researcher. Second, semi-structured interviews were carried out with a sub-set of 41 participants (20 adolescents and 21 adults) from the treatment arm of the trial. For these, participants were selected purposefully to achieve a balance of urban/rural location, gender, age as well as session attendance and engagement. Interview guides included open-ended questions probing participants to reflect upon their programme experiences and any changes (positive or negative) that they and their families had experienced as a result of the intervention. Further probes were used to elicit underlying causes and processes of changes. All interviews were conducted in isiXhosa by a trained qualitative researcher. Interview recordings were then transcribed in English (see also Doubt et al., 2017).

All participants gave verbal and written consent to participate in the study. No monetary incentives were given, but small food parcels were distributed in appreciation of participants' time. Ethical approval was obtained from the Universities of Oxford (SSD/CUREC2/11-40) and Cape Town (PSY2013-46) and the South African Eastern Cape Provincial Departments of Social Development and Education.

Questionnaires were conducted with both adults and adolescents in 552 targeted households. However, we focused on the adult sample only for the quantitative analyses presented in here, given that the outcome of interest was financial behaviour. With regards to the qualitative data analyses, we also considered adolescent accounts of changes that were perceived and experienced within their households and families.

Intervention

The intervention was developed as part of the World Health Organization's and UNICEF's "Parenting for Lifelong Health" initiative. The programme named "Sinovuyo Teen" (translated as "we have joy") went through two piloting and adaptation phases with low-income families in South Africa, pointing to positive reception and cultural adequacy in both pre-post studies (Cluver et al., 2016a). The final version of the programme comprises 14 weekly sessions, each lasting around three hours. Sessions were group-based and delivered to 12-16 caregiver-adolescent pairs per study location. The delivery format was explicitly non-didactic, interactive, and offering a range of alternative strategies (e.g. different ways to save money, different prioritization choices for a monthly budget). This was motivated by research suggesting that active choosing can both help overcome inertia and ensure that choices are tailored to family's needs and circumstances (see Sunstein, 2012). Each session was built on activity-based learning methods, including role plays, traditional songs and dances, and a shared meal. Twelve sessions consisted of an evidence-informed parenting training, aiming to build positive and nurturing relationships between caregivers and their adolescents. Sessions further emphasised socio-emotional learning, anger and aggression management, and establishing rules and routines in a household. Two sessions featured a financial literacy training on budgeting and saving. Discussions and activities evolved around financial goal setting, budgeting for one grant cycles, preparing for emergencies, understanding debt and interest rates, and different saving methods. Session content was further reinforced through small homework practices to be discussed with other family members or an assigned programme 'buddy' from the same village.

Qualitative Analysis

Qualitative data analysis preceded quantitative data analysis and was primarily used to identify and uncover the potential pathways underlying changes in participants' financial behaviour. Transcripts from in-depth interviews and focus group discussions were coded using thematic analysis (Braun & Clarke, 2006). Codes were generated for distinct pathways of change and considered relevant if a similar narrative emerged across study locations and was repeatedly mentioned by different programme participants. Illustrative quotations were selected for each separate theme. Data were coded by the lead author and codes were reviewed by a second author (JIS & DN). Disagreements were resolved through discussion and third author arbitration (JD).

Quantitative Analysis

Mediation Analysis

The goal of our quantitative analysis was to disentangle the average treatment effect (ATE) of the Sinovuyo Teen programme into a) the *indirect effects* running through several observed intermediate variables and b) the *direct effect* running through other (unobserved) channels. For this purpose, we used mediation analysis which has a long tradition in social sciences and is most prominently associated with the work of Baron and Kenny (1986). More recently, mediation analysis has been popularised in the field of economics, largely motivated by the work of Imai and colleagues (2010a, 2010b, 2011) on "causal mediation analysis". Here, the mediation effect represents the *indirect effect* of the treatment (here: the Sinovuyo Teen project) on the outcome (here: financial behaviour) via the mediating variable and is defined as follows:

$$\delta_i(t) = Y_i(t, M_i(1)) - Y_i(t, M_i(0)) \quad (1)$$

whereby δ_i denotes the change in the outcome variable, dependent on changes in the mediator from values realised under the control condition $M_i(0)$ to those realised under the treatment condition ($M_i(1)$), fixing the treatment status at *t*.

All other (unobserved) mechanisms are then summarised in the *direct effect* of the treatment as:

$$\zeta_i(t) = Y_i(1, M_i(t)) - Y_i(0, M_i(t)) \quad (2)$$

In the present example, this would represent the difference in financial behaviour when comparing the treatment and control group, holding all hypothesised mediators constant.

Imai and colleagues (2010a, 2010b) suggest that mediation effects are nonparametrically identified and allow for a quasi-causal interpretations if two "sequential ignorability" assumptions are satisfied: First, it is assumed that the treatment assignment is statistically independent ("ignorable") of the outcome and the mediator (in other words: there is no bias from omitted variables). Second, it is required that the mediator is statistically independent of the outcome, conditional on the treatment and observed baseline variables.

The first assumption is guaranteed to be satisfied in our case, as the treatment is randomised. The second assumption, however, is problematic as mediating variables are not randomised. We therefore cannot rule out whether unobserved variables – that were somehow affected by the treatment – confound the relationship between mediator and outcome (Heckman & Pinto, 2015; Nguyen et al., 2015). In response to this, Imai and colleagues (2010b) have developed a sensitivity analyses to quantify the extent to which findings are robust to violations in the sequential ignorability assumption. The sensitivity model is given by:

$$M_i = \alpha_1 + \beta_1 T_i + \delta_1 \text{`} X_i + \varepsilon_{i1} \quad (4)$$

$$Y_i = \alpha_2 + \beta_2 T_i + \gamma M_i + \delta_2 \text{`} X_i + \varepsilon_{i2} \quad (5)$$

where the sensitivity parameter ρ denotes correlation between the error terms ε_{i1} and ε_{i2} from the mediator and outcome models above. If the sequential ignorability assumption holds true, ρ is equal to zero. Although we cannot know the true value of ρ, sensitivity analysis computes the indirect effect for different hypothetical values of ρ. Accordingly, if the indirect effect turns zero for small values of the sensitivity parameter, we conclude that small violations of our ignorability assumption would reverse the inferences that we draw. Given that there is not a general cutoff for values of ρ, Imai and colleagues (2010b) introduce an alternative interpretation based on R^2 parameters. These denote the proportion of the total variance in both the mediator (R^2_M) and outcome (R^2_Y) that is possibly explained by an unknown confounder. Hence, we can establish how small this proportion would have to be for our mediation results to hold.

Following this approach, we selected mechanisms that were identified by our qualitative analysis and for which we had quantitative measures and tested them as mediators. In these analyses, the predictor variable consisted of the binary dummy for treatment status, i.e. assignment to either control or intervention arm. The outcome was an aggregate index of financial behaviour, reflecting self-reported past-month saving (binary), borrowing from family members, friends or moneylenders (ordinal, "never" to "very often"), and avoidance of consumption shortfalls (ordinal, "never" to "very often"), which is reflective of a person's budgeting skills (see Table A1). Weights for each item were determined based on principal component analysis and individual items were added up into an aggregate index that was centered around zero. The financial behaviour

index therefore not only captures whether a person was able to accumulate some savings in the past month but also considers his/her ability to smooth consumption over time, both through avoiding borrowing as well as through avoiding budget shortfalls for some basic needs. We then used a nonparametric bootstrap procedure with 1000 repetitions to calculate the average mediation effect for each pathway highlighted by the qualitative analysis. Subsequent sensitivity analyses for each respective mediator were ran, inspecting both values of ρ and $R^2_M R^2_Y$.

Structural Equation Model

In a final step, significant mediating variables were entered simultaneously into a structural equation model (SEM). Structural equation modelling is a powerful technique for estimating complex path models and has been used previously in development research (see Swain & Wallentin, 2017, 2012; Chakrabarti & Biswas, 2012). A SEM is composed of two parts, namely (i) a measurement model and (ii) a structural model. In the former model, predicting, mediating and outcome variables are treated as *latent factors*, which cannot be measured directly but are proxied by the observed indicators presented Table A1. In this measurement model, each individual indicator is assigned a specific weight based on correlation structures in the data. The latter model then serves to estimate the structural relationships between included latent variables and to provide simultaneous estimates for several dependent (or here: intermediate) variables.

The structural equation model is represented by the following simultaneous equations:

$$x = \Lambda^x\_\zeta + \delta \quad (6)$$

$$y = \Lambda^y \eta + \varepsilon \quad (7)$$

$$\eta = r\,\zeta + \xi \quad (8)$$

Equation (6) corresponds to the measurement model, where x is a vector of indicators for the latent construct ζ, Λ^x is a vector of factor loadings and δ is a vector of measurement errors for each indicator. In equation (7), Λ^y is a vector of factor loadings and ε is a vector of measurement errors associated with y, with η corresponding to the latent construct. Equation (8) denotes the structural model, indicating that the latent factor η depends on

the vector of latent component (ζ), ɾ is the vector of latent regression coefficients, and ξ is the error term.

We assess the overall validity of the proposed path model by examining pertinent Goodness of Fit statistics. These include the Comparative Fit Index (CFI; Bentler, 1990), the Root Mean Standard Error of Approximation (RMSEA), and the Standardised Root Mean Square Residual (SRMR; Bentler, 2007). Conventional cut-offs indicating a good model fit require the values of CFI to be over 0.95 and lower than 0.05 for RMSEA and SRMR (Hu & Bentler, 1999). Following Brown (2015), the model was refined for improved goodness of fit by taking modification indices into account and correlating respective item residuals in case this appeared conceptually justified.

In all analyses described above, we controlled for rural/urban location and baseline values for each mediating variable as well as for the composed outcome variable of financial behaviour. Analyses were conducted in R Studio using the 'mediation' (Tingley et al., 2014) and 'lavaan' package (Rosseel, 2012).

Statistical Power

The sample size for the cluster RCT was originally determined based on an assumed standardised mean difference of 0.36,[ii] desired power of 0.80 with 95% confidence, and an intra-cluster correlation coefficient (ICC) of 0.08. A final sample size of 40 equal clusters, with an average of 12 families per cluster, and oversampling by 10% to account for potential attrition was established. However, given that the ICC for the outcome variable of financial behaviour was considerably smaller than initially assumed (0.02 instead of 0.08), statistical power was effectively higher. We will therefore provide Monte Carlo simulated post-hoc power calculations (with 2000 replications) for all tested mediating pathways in Table A2 (see Kelcey et al., 2019).

III Results

Demographics

Table 1 summarises baseline demographic information of the study sample. The adult sample was largely female in result of the recruitment focus on primary caregivers. The age range was 18-92 years with many primary caregivers being grandmothers rather than mothers, often replacing a deceased biological mother. The sample is further

characterised by high poverty rates: Less than 10% of study participants were formally or informally employed and around one third lived in informal housing (also referred to as 'shacks'). Further, respondents reported shortages of food for an average of almost three out of seven week-days. At baseline, less than 20% of participants were able to save some money in the past month and reliance on borrowing from friends, neighbours, and informal moneylenders ("loan sharks") was high. The average monthly per capita income from welfare grants was 350.00 ZAR (equivalent to 26.00 USD).

Randomisation verification (see last Column, Table 1) suggested that treatment and control group were balanced across most variables with an exception of participant sex (the proportion of women was larger in the treatment group), household size (larger in the treatment group), and baseline borrowing rates (higher in the treatment group).

Table 1. Sample Description at Study Baseline

	Full Sample Mean (SD) Range	**Control**	**Treatment**	Equality of means test
Age	49.37 (14.69) 18-92	49.94 (14.20) 19-84	48.79 (15.20) 18-92	1.149
Female	0.95 (0.22)	0.93 (0.26)	0.97 (0.17)	-0.041*
HIV-positive	0.27 (0.44)	0.28 (0.45)	0.26 (0.44)	0.017
High school degree & higher	0.37 (0.48)	0.36 (0.48)	0.38 (0.49)	-0.023
Currently employed (formal & informal)	0.06 (0.24)	0.07 (0.25)	0.05 (0.22)	0.016
Informal housing	0.72 (0.45)	0.74 (0.44)	0.71 (0.45)	0.025
Number of household members	5.17 (2.18) 2-16	4.99 (2.06) 2-16	5.36 (2.29) 2-14	-0.366*
Hungry days/week	2.85 (2.23) 0-7	2.88 (2.18) 0-7	2.82 (2.29) 0-7	0.060
Household asset index	0.00 (1.23) -1.62 – 5.20	-0.09 (1.21) -1.62 - 3.74	0.09 (1.25) -1.62 – 5.20	-0.184
Welfare grant per capita income	422.49 (410.32) 0-5356.67	428.81 (496.29) 0-5356.67	415.92 (296.24) 0-1590.00	12.769
Any Savings past month	0.18 (0.38)	0.17 (0.38)	0.18 (0.39)	-0.007
Borrowed from friend/family past month	0.61 (0.49)	0.56 (0.50)	0.67 (0.47)	-0.115***
Borrowed from moneylender past month	0.44 (0.50)	0.46 (0.50)	0.42 (0.49)	0.037
Financial behaviour index	0.00 (1.18) -3.18 - 3.44	-0.03 (1.17) -3.18 - 3.37	0.03 (1.20) -3.01 - 3.44	-0.060
Financial self-efficacy index	2.71 (2.18) 0-9	2.74 (2.18) 0-9	2.68 (2.18) 0-9	0.057
Optimism index	0.00 (1.51) -4.16 - 2.91	-0.01(1.51) -4.16 - 2.91	0.01 (1.51) -4.08 - 2.91	-0.024
Community social support index	0.00 (2.88) -7.01 - 3.32	0.12 (2.96) -7.01 - 3.32	-0.01(2.81) -7.01 - 3.32	0.026
Positive caregiver-teen relationship index	0.00 (1.81) -4.67 - 4.85	-0.05 (1.79) -4.21 - 4.43	0.06 (1.84) -4.67 - 4.85	-0.112
Observations	**552**	**282**	**270**	
F-test of joint significance				***5.010******

Notes: Standard deviations in parentheses, range shown for continuous variables.

Qualitative Analysis Results: Pathways of Change

Three salient pathways of positive change emerged from the qualitative interviews and discussions with programme participants, corroborating the importance of psychosocial factors in line with our theoretical framework. It is also important to note that none of the participants reported harm or any negative effects and only a minority reported no change (7/62 adults) (often due to constrained female involvement in financial decision making in a home). Comparing this with our quantitative data, 10.7% of participants did not experience any increases in their past-month savings and 27.3% of participants did not report any reductions in past-month borrowing.

Pathway 1: Financial planning confidence

A first pathway emerged from participants' narratives of newly acquired financial resulting changes in financial management practices (mentioned by 42/62 adults and 8/20 adolescents). Accordingly, many interviewees referenced specific content covered in the two economic sessions and described how participation in the programme had raised their awareness of suitable strategies to save money. Linked to this, participants felt encouraged to take up new saving practices (*"Now I know how to save"* [female adult, urban cluster]), thus corroborating our quantitative findings that revealed significant increases both in formal savings and savings held in a savings group (see omitted to maintain author anonymity). In some cases, workshop attendance has led participants to substitute previous informal – and potentially less effective – saving strategies with new forms of saving money. These were mainly motivated by considerations of protection from loss, increased safety, and reliability:

''I was doing a stokvel [saving group] with my friends. Two of them passed away so I had a loss but I learned if I had taken my money to the bank it would not have happened.'' [female adult, urban cluster].

"I have learned how to bank my money because if you think you will hide your money at home, there is something that can happen in the house and will make you lose your money." [female adult, urban cluster].

However, although the majority of participants seemed to favour saving in a bank account after participation in the programme, some still reported preference for alternative saving methods, noting for instance: "*It is better when you keep your money at home rather than at the bank, because at the bank they will steal it."* [female adult, rural cluster]. This suggests that the lack of trust in financial institutions constitutes a substantial barrier to formal saving. The non-didactic approach[iii] of the programme aimed to empower participants to base their decisions on their individual needs and circumstances rather than endorsing one specific strategy. The variation in preferences for different saving strategy is likely reflective of this.

Further, participants described how newly acquired skills helped them budget their monthly grant income:

"I learned that budgeting is about not using more money than you have, basically to live within your means.'' [female adult, rural cluster]

"A skill I learned at Sinovuyo is the budgeting which is important as my teen is about to go to initiation school [circumcision preparation]." [female adult, rural cluster]

These gains in financial skills were also tied to more deliberate financial planning in general (20/62 adults and 6/20 adolescents). Most commonly, interviewees listed itemised anticipated expenses prior to actual spending, as expressed in multiple references to *"shopping lists*," and having learned to prioritise certain expense areas over others. In line with our theoretical framework, some participants also pointed to improvements in self-control and patience (7/62 adults), emphasised by statements such as *"It taught me the difference between needs and wants"* [male adult, rural cluster] or *"I'm strict with my money now"* [female adult, urban cluster].

The above evidence implies a close link between financial skills and financial behaviour that may stem from increases in financial self-efficacy, as also documented in our quantitative analyses (see omitted to maintain author anonymity). New planning and saving skills appear to have increased participants' confidence levels and trust in themselves, commonly framed by expressions such as: "*now I know" or "now I can"*. Consequently, these positive cognitive self-evaluations may have become psychological motors of action, driving the uptake of saving and more deliberate budgeting.

Pathway 2: Optimistic future outlook

A second potential pathway was based on participants' accounts of a more positive and optimistic future outlook (16/62 adults and 5/20 adolescents), motivated by the saving goals formulated and discussed in programme sessions. Common saving goals included *"building a house"* and "*fostering children's education*". Further, saving goals consisted of participation in cultural events such as "*initiation ceremonies*," celebrated to signal a boy's transition into manhood after circumcision, or the "*matric dance*" at high school completion. A number of participants suggested that these goals were motivated by the inspirational stories featured in the intervention curriculum:

"I learned from the story of Mama Nontlantla [story character], *because it helped me to save and have a purpose for saving, knowing what I am saving for."* [female adult, rural cluster]

Accordingly, in some instances participants may have turned these story characters into role models, who animated them to deconstruct perceived constraints and envision their future in a more optimistic, positive way. The resulting optimism may have challenged feelings of resignation and hopelessness, thus mobilising action and changes in financial behaviour. This was most evidently expressed in narratives such as "*one does not have to have lots of money to start saving"* [female adult, rural cluster] or "*you can budget no matter how small the amount"* [female adult, rural cluster].

The more optimistic future outlook can also be viewed as a facilitator of prospective planning. Accordingly, participants perceived that they had become more aware of the need for and purpose of saving. In relation to this, an important theme throughout the qualitative data was the shift from present-biased planning and cognition to increased orientation towards the future and building of security buffers in anticipation of possible future risks (14/62 adults and 1/20 adolescents). This was repeatedly emphasised as saving and preparing for economic shocks, referred to as *"emergencies", "something bad happening"* or *"a crisis"*. Similarly, several participants reported prevention of future indebtedness through *"avoiding loan sharks".* These changes in financial behaviour were also supported by quantitative findings showing reductions in past-month borrowing rates (see omitted to maintain author anonymity).

Pathway 3: Social support within and outside the home

Finally, participants identified improved social support as an important driver of financial change. Statements mainly reflect the "network channel" as outlined in our theoretical framework. Social support was articulated as occurring either *within* a household (17/62 adults, 14/20 adolescents) or *outside*, provided by neighbours or friends (6/62 adults). Within participants' homes, social support was explicitly strengthened through programme content on the formation of supportive caregiver-child interactions, promotion of positive parenting behaviour, and practices of mutual praise and spending time together. Tied to this, adult and adolescent participants respectively provided detailed descriptions suggesting that they had started spending more time with each other, both through budgeting together and advising each other on financial plans. Participants noted how budgeting became a shared activity in their homes that served as a regular reminder of endorsed financial management tools, helped consolidate acquired

skills, and integrated careful financial planning into families' day-to-day lives. Thus, changes in financial behaviour were likely reinforced through increased social encouragement and mutual support within the household:

"The relationship with my teen changed after Sinovuyo. Now we can sit and spend time talking, advise on things to buy and prepare a shopping list together." [female adult, rural cluster]

"A lot has changed at home once attending Sinovuyo. There was no communication between us, now there is. My Mum never praised me when I did something good, now she does. We never had a budget before, now we budget together.'' [female adolescent, rural cluster]

"Sinovuyo gave me and my family an open mind of doing budgeting and saving with my children so that if there is a problem at home we should go and take money at the bank and not go to a loan shark." [female adult, rural cluster]

Shared financial planning occurred not only between the parent-child pair enrolled in the programme but also spilled over to other family members. This likely helped embed programme content such as monthly saving practices into household decision-making practices. It also provided an opportunity for the intentional wider impact of the from the participating pair to the rest of the family.

"We budget with the family and sometimes the kids do the budgeting. We discuss things that affect us together as a family." [female adult, urban cluster]

"Everyone at home wanted us to come back and share the stories from sessions and the children will recite everything we say […] We did home practice as a family. All participated, especially when we did the budget." [male adolescent, rural cluster]

Likewise, the group-based and socially adhesive nature of the programme may have fostered social support *outside* the home. The pilot study already found evidence that participants continued to meet individually (with their assigned village "buddies") and in small groups after the programme implementation. This, in turn, may have helped to consolidate planned financial management through the salience of new social norms as well as through positive peer pressure *("We remind one another about Sinovuyo and advise one another on budgeting"* [female adult, rural cluster], "*We ask each other how much we have saved"* [female adult, urban cluster]).

Quantitative Analysis Results

The potential pathways highlighted by qualitative evidence were subsequently tested quantitatively. Variables for the quantitative model were selected to closely match the social and psychological factors that emerged from the qualitative analysis. However, it needs to be cautioned that some of the aspects highlighted in our qualitative analysis (e.g., self-control) were not measured quantitatively and could thus not be included in the analyses below. For *Pathway 1*, standardised questionnaires included two items capturing participants' confidence to deliberately budget their monthly resources and smooth consumption over a grant cycle. Here, we refer to this behaviour as **financial self-efficacy** (see also Dietz et al., 2003). For *Pathway 2*, to capture **optimism**, we used the reversed CES-D depression scale (as in Radloff, 1977). *Pathway 3* was divided into two aspects of **social support**: support *within* a household and support from *outside* the family. For within-household support, we used 10 items denoting a positive caregiver-child relationship drawn from the Alabama Parenting Questionnaire (Frick, 1991). The measure for extra-familial support was drawn from the Medical Outcome Study's Social Support Survey and included 14 items on emotional and affectional support from a person outside the family (Sherbourne & Stewart, 1991). All measures are summarised in Table A1 and had been piloted and culturally adapted for the study sample.

Mediation Analysis

First, we tested each individual factor from above in a separate mediation model. Results from these models are summarised in Table 2. In the first column, we present treatment effects on each tested mediator, showing that the programme significantly improved participants' levels of optimism and self-efficacy and also significantly increased social support in the communities and at home. The average mediation effect (abbreviated as ACME in Imai et al., 2010a,) was only significant for the psychological factors, namely 0.12 (95% CI [0.07, 0.19], $p<0.01$) for optimism and 0.13 (95% CI [0.07, 0.21], $p<0.01$) for self-efficacy. Accordingly, 22% of the total effect of the programme on financial behaviour was mediated through the optimism pathway and 24% through the self-efficacy pathway. While both social factors of community social support and caregiver-child relationship showed significant improvements in the treatment group at post-test (see first column of Table 2), the ACME was non-significant for both putative mediators.

Table 2. Mediation Analysis Results for Outcome of Financial Behaviour

Mediating Measure	Effect of Programme Participation on Mediator	Average Mediation Effect	Direct Effect	Total Effect	% of Total Effect Mediated	Sensitivity	
						ρ at which ACME=0	$R^2_M R^2_Y$ at which ACME=0
Psychological Factors							
Optimism	0.70*** (0.13)	0.12*** [0.07, 0.19]	0.43*** [0.23, 0.66]	0.55*** [0.35, 0.77]	22% [0.11, 0.41]	0.25	0.049
Financial Self-Efficacy	1.31** (0.22)	0.13*** [0.07, 0.21]	0.42*** [0.21, 0.63]	0.55*** [0.36, 0.76]	24% [0.11, 0.45]	0.20	0.030
Social Factors							
Social support outside the home	0.96*** (0.24)	0.02 [-0.01, 0.06]	0.53*** [0.33, 0.74]	0.55*** [0.35, 0.75]	4% [-0.02, 0.12]	0.05	0.00
Social support inside the home	1.58* (0.17)	0.05 [-0.04, 0.15]	0.52*** [0.30, 0.76]	0.56*** [0.37, 0.77]	8% [-0.08,0.29]	0.05	0.00
Sample Size	**534**						

*Notes: *p<0.1, **p<0.05, ***p<0.01. Clustered standard errors in brackets. 95% Cis in square brackets, based on* a nonparametric bootstrap procedure with 1000 simulations**.** *Financial behaviour is composed of past-month saving and past-month borrowing from moneylenders and/or friends/family members, and four items on past-month monetary shortfalls.*

However, given the salience of the social support pathway in our qualitative data analysis and the suggested importance for households' financial behaviour, we also test whether these factors could be associated with our outcome *via* other variables, namely the psychological factors. Hence, we define optimism and self-efficacy as outcomes in a subsequent mediation analysis. Then, we test whether the two social support factors are potential mediating variables explaining the link between treatment exposure and improvements in psychological factors. Indeed, as shown in Table 3, the effect of the treatment on optimism was mediated by community social support (ACME=0.13, 95% CI [0.06, 0.21], p<0.01) as well as by family social support (ACME=0.27, 95% CI [0.15, 0.43], p<0.01). More precisely, 19% of the programme's total effect on optimism is mediated through community social support and 39% through a positive and nurturing caregiver-child relationship. In Table 4, we show mediation effects for the outcome of financial self-efficacy. Here, community social support is a significant but rather weak mediator (mediating only 6% of the total effect). It is also sensitive to small violations in the sequential ignorability assumption (see below). However, family social support emerges again as a strong mediating factor, with ACME=0.44 (95% CI [0.25, 0.67], p<0.01) and 35% of the total effect on financial self-efficacy mediated.

Table 3. Mediation Analysis Results for Outcome of Optimism

Mediating Measure	Average Mediation Effect	Direct Effect	Total Effect	% of Total Effect Mediated	Sensitivity	
					ρ at which ACME=0	$R^2_M R^2_Y$ at which ACME=0
Social Factors						
Social support outside the home	0.13*** [0.06, 0.21]	0.57*** [0.33, 0.86]	0.70*** [0.46, 0.99]	19% [0.08, 0.34]	0.25	0.052
Social support inside the home	0.27** [0.15, 0.43]	0.44*** [0.17,0.73]	0.71*** [0.45, 0.98]	39% [0.19, 0.67]	0.20	0.027
Sample Size	**534**					

Notes: See Table .

Table 4. Mediation Analysis Results for Outcome of Financial Self-Efficacy

Mediating Measure	Average Mediation Effect	Direct Effect	Total Effect	% of Total Effect Mediated	Sensitivity	
					ρ at which ACME=0	$R^2_M R^2_Y$ at which ACME=0
Social Factors						
Social support outside the home	0.08** [0.01, 0.17]	1.23*** [0.79, 0.63]	1.31*** [0.86, 1.74]	6% [0.01, 0.14]	0.10	0.008
Social support inside the home	0.44*** [0.25, 0.67]	0.79*** [0.33, 1.22]	1.23*** [0.81, 1.67]	35% [0.19, 0.62]	0.20	0.027
Sample Size	**534**					

Notes: See Table 2.

Post-hoc statistical power calculations for all above mediation analyses are summarised in the Table A2, displaying both the effective statistical power for each tested path as well as ICCs for outcome and mediation variables. Statistical power for each of the statistically significant mediating pathways presented above ranged from low (<60%) to high (>80%). To illustrate this, our Monte Carlo simulations suggest that we had a 99% chance of discovering induced changes in self-efficacy and optimism that ran through higher family social support.

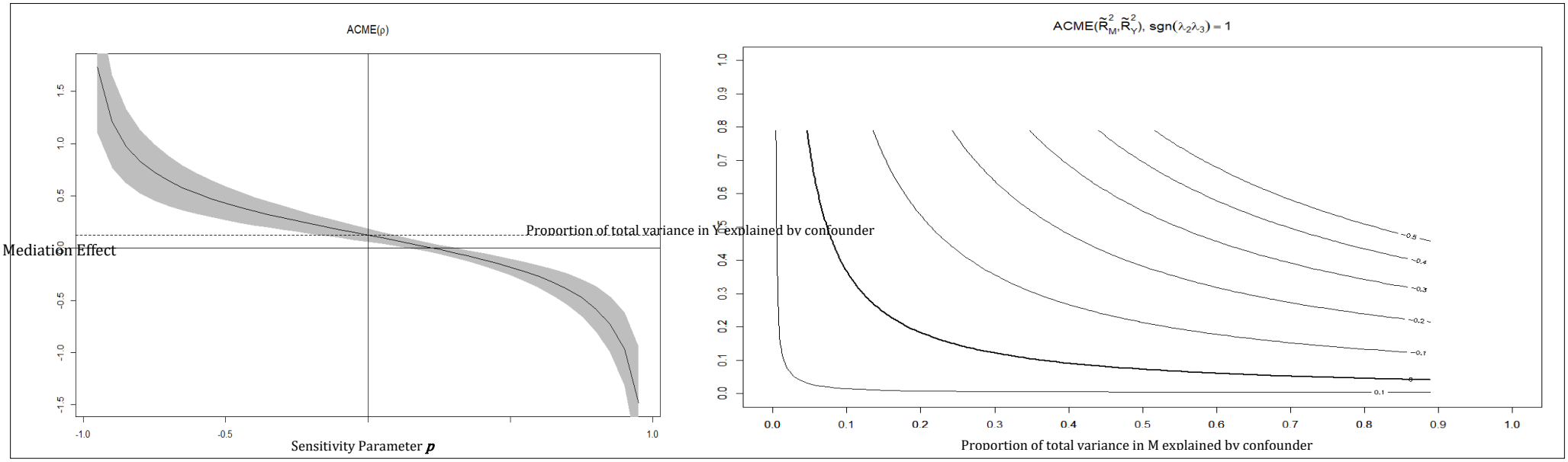
Sensitivity Analysis

As outlined above, it is important to determine how robust significant ACMEs are to violations in the sequential ignorability assumption. Therefore, in the last two columns of Tables 2-4, we also reported values for the sensitivity parameters ρ and $R^2_M R^2_Y$ for which mediation effects would turn zero and reverse direction. If the sequential ignorability assumption holds, ρ would equal 0 and the ACME correspond exactly to the values presented in Tables 2-4.

For the mediating variable optimism (Table 2), we show that the ACME would turn to zero for ρ=0.25 (for illustration purposes, see left panel of *Figure 1*). For ease of interpretation, we also computed the ACME as a function of the proportion of total variance in the mediator and outcome variables that is explained by a common confounding factor. Here, we show that the ACME for optimism would turn non-significant or negative if the product for these proportions was greater than the critical value of 0.05 (see right panel *of Figure 1*). Effectively, our results would thus not hold if there was a common unknown confounder explaining >22%[iv] of the variance in the mediator and outcome. To put this requirement into context, we have looked at the proportion of variance that is explained in both mediator and outcome by *observed* confounding variables. For instance, baseline level of education explains only 1% of the variance in financial behaviour and between 0.5% and 1.2% of the variance in tested mediators. Similarly, an index of household living standards and ownership of assets explains 2% of the variance in financial behaviour and between 0% and 2.1% in mediating variables. Based on these reference points, the positive mediation effect for optimism can be considered as quite robust to possible unobserved confounding. The mediation effect for financial self-efficacy was slightly less robust, suggesting that the ACME would not hold if a confounding variable explained >17% of the variance in self-efficacy and financial behaviour.

Tables 3-4 present the results from subsequent mediation models with psychological variables as outcomes and the social support variables as mediators. First, as shown in Table 3 the ACME of community social support for the effect of the Sinovuyo Teen project on participants' levels of optimism was quite robust to the possible unobserved pre-treatment confounding, holding if <23% of variance was explained by a common confounder in both mediator and outcome. Similarly, the ACME of family social support was fairly robust. holding if <16% of variance was explained. For the effect of the treatment on participants' levels of self-efficacy (see Table 4), family social support was again confirmed as a relatively robust mediating variable (holding if <16% of variance was explained). By contrast, community social support was sensitive to small violations in the ignorability assumption and would turn undistinguishable from zero if an unknown confounder explained only 9% of the variation in the mediator and outcome.

Figure 1. Sensitivity Analysis: Optimism

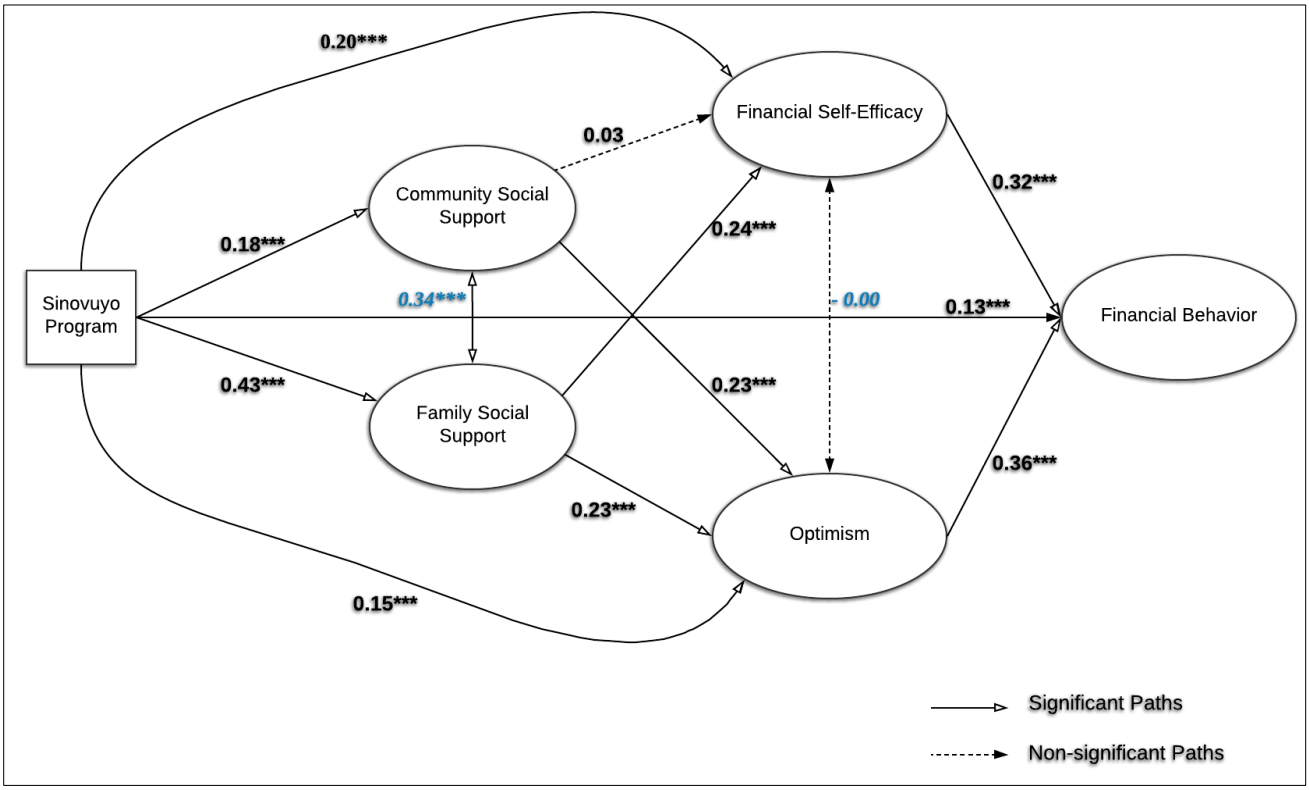


Notes: Plots correspond to the sensitivity analysis for the mediator "optimism" linking programme participation to changes in financial behaviour. In the left panel, we plot the sensitivity parameter ρ (i.e. the correlation between error terms in the mediation and outcome regression models) against the average mediation effect (ACME). The dashed line presents the ACME under the sequential ignorability assumption. The shaded area represents point estimates and 95% confidence intervals for different values of ρ. In the right panel, the contour lines represent the ACME as a function of the proportion of total variance in M (optimism) and Y (financial behaviour) that is explained by a common unobserved confounder, assuming that the confounder impacts both M and Y in the same direction. The contour line in bold shows all possible values of the product $R^2_M R^2_Y$ for which the ACME is 0.

Structural Equation Model

In the final analysis step, all mediating factors from above were entered into a structural equation model, allowing us to simultaneously estimate all putative mechanisms of change. Corroborating findings from the mediation analysis from above, self-efficacy and optimism remained significant mediating pathways in the final model. Both social support variables (family and community social support) were not directly linked to the outcome variable but had a subordinate indirect impact on financial behaviour *via* the two psychological pathways, namely optimism and self-efficacy. Finally, three modifications were made to correlate error terms of related item pairs for improved model fit. The final path model is summarised in Table A3 in the Appendix and visualised in Figure 2.

Figure 2. Path Diagram on Pathways of Change



*Notes: *p<0.1, **p<0.05, ***p<0.01. All coefficients are standardised estimates. Covariances in blue.*

As reported in Figure 2, the programme effect on financial behaviour was mediated by financial self-efficacy and optimism, with significant paths linking both treatment and mediators and mediators and outcome. Further, programme participation increased levels of family social support ($\beta=0.43$, $p<0.001$) and community social support ($\beta=0.18$, $p<0.001$). These variables then further reinforced financial self-efficacy ($\beta=0.2$, $p<0.01$, $\beta=0.03$, $p>0.10$, respectively) and optimism ($\beta=0.23$, $p<0.001$, $\beta=0.23$, $p<0.001$, respectively), and are thus indirectly linked with the outcome of planned financial behaviour. Notably, social support from *inside* and *outside* the home was positively and significantly correlated ($\tau=0.34$, $p<0.001$). However, participants' level of optimism and perceived financial self-efficacy were not statistically associated, thus contrasting previous empirical findings (e.g. Conradie & Robeyns, 2013).

Goodness of fit for the individual measurement models was satisfactory and strongest for the outcome variable of financial behaviour and the mediating variable of parent-child relationship. The goodness of fit of the final model was good according to a CFI value of 0.98 and RMSEA 0.079, but only decent according to the SRMR (0.103) (see Table A3). However, Brown (2105) advises against applying model fit cut-offs unequivocally and we thus refrain from further post-hoc – and largely a-theoretical – modifications to our model.

IV Discussion

This paper set out to conduct an in-depth, mixed-methods examination of changes in financial behaviour that resulted from participation in a combined parenting and financial literacy intervention for low-income families in South Africa. Corroborating our initial theoretical framework, we show that psychological factors play a central role in helping participants act upon their saving and budgeting intentions. First, we report increases in levels of confidence and self-efficacy, possibly in result of new financial management skills as well as mutual support, joint problem solving, and positive encouragement between programme participants, their peers, and their family members. Similarly, we observe more optimistic and hopeful mind-sets among programme participants. This change might be partly driven by "role model effects", whereby the financial achievements of a role model featured in the curriculum or of a peer group

member (such as reaching a saving goal) may help participants aspire to similar outcomes and thus motivate them to save or budget carefully. Further, the future may become more salient if family members remind each other about their saving goals and plans. Together, these mechanisms then materialise in optimisations of saving and borrowing behaviour.

In contrast to previous theoretical literature, we found fewer evidence suggesting that social factors *directly* caused the observed changes in financial behaviour. Instead, our analyses suggest that social factors had an emotional and psychological resonance, which then, in consequence, led to improvements in saving and budgeting choices (see also Hardcastle, 2012). With regards to the a priori theoretical framework, our analyses did also not confirm a distinct peer pressure channel. Participants' descriptions of their social interactions primarily included accounts of mutual encouragements, joint budgeting activities, and social reminders - rather than reflecting any notions of guilt or reputation concerns. Several limitations of this analysis are noteworthy. First, measures relied exclusively on self-reported information that was not triangulated with observational data or administrative records on financial flows. Therefore, it is possible that participants overstated the changes resulting from the programme due to a demand or "Hawthorne effect". We tried to alleviate possible social desirability bias by capitalising on self-administered interview technology in the form of ACASI questionnaires, thus eliminating potential interviewer judgment. We gain further confidence from recent experimental evidence, which tested the influence of demand effects and could not confirm that measured outcomes were significantly affected by these (see de Quidt et al., 2018, Mummolo & Peterson, 2018, Jayachandran et al. 2918).

Second, pathways tested were partly defined by the design of questionnaires and thus data availability. For instance, in qualitative interviews and group discussions, participants had highlighted the importance of prioritising "needs" over "wants" and "being strict" with regards to their monetary expenses. A more focused measure of self-control and temptation spending could have helped to test the influence of these aspects quantitatively. Likewise, a measure of time preferences and myopia would have helped to further validate the channels indicated by the qualitative evidence.

Third, full post-test data was only collected at one wave, five to nine months after delivery of the intervention. Given that it is not possible to establish temporal sequence between mediating and outcome variables, our quantitative analyses are not adequately equipped to claim causality of the suggested pathways. Yet, our use of a mixed-methods framework and examination of qualitative data can shed light on the directionality of effects and the putative causal mechanisms at play. It can thus help to partly overcome some of the inherent limitations of stand-alone RCT data.

Fourth, it was not possible to determine the isolated effect of different programme components within the given research design and without multiple treatment arms. We were therefore not able to determine whether treatment effects could have been retrained if certain programme components, for instance the two financial literacy sessions, had been removed or considerably shortened. Despite this shortcoming, the results presented in this paper elucidate important inter-linkages between psychological, social, and economic programme components. Further, from a policy perspective, our results corroborate the argument that the intervention should be scaled-up as a whole. Future research could attempt to separate out different programme components to test their isolated impact and establish whether some elements are possibly redundant and could be omitted for increased cost effectiveness.

Despite these limitations, our findings motivate two important programming implications. First, it may be desirable for future programmes to mobilise social cooperation and emotional support by featuring group elements and ideally targeting several members of the same household or family. Indeed, a recent multi-arm randomised controlled trial from Indonesia found that impacts of a literacy programme on a range of financial behaviours were significantly increased when the entire family was targeted, rather than only the male migrant worker or the remaining family members (Doi et al., 2014). Second, acknowledging the central relevance of psychological properties, Dalton and Ghosal (2010) propose the use of psychological components such as cognitive behavioural therapy, motivational interviewing or mindfulness practices for the promotion of individual welfare. These programming implications are not only relevant for financial literacy programmes, as has been suggested in this study, but may

also boost the effectiveness of related poverty reduction programmes, including microcredit, cash transfer, and schooling programmes.

Endnotes

[i]For instance, the child support grant that is most widely received amounts up to 380.00 ZAR (equal to 32 USD).

[ii]This mean difference was established for the trial's primary outcomes of child maltreatment and parenting skills.

[iii]For instance, one of the activities incorporated in the financial literacy session involved an interactive debate on the risks and advantages of different saving strategies for which participants had to physically engage in the discussion by walking to the corner in the room that represented their opinion (i.e. one corner for safe versus one corner for unsafe saving strategies).

[iv]The percentage of variance to be accounted for is given by the critical value of 0.05, i.e. $0.22*0.22=0.049$. The same would be true for a higher percentage explained in the mediator or the outcome and a lower percentage in the other, respectively. This is visualised in the right hand panel of Figure 19.

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APPENDIX

Table A1. Results for the Final Structural Equation Model

Structural Model					
	Positive Caregiver-Child Relationship	Emotional/Affectionate Social Support	Financial Self-Efficacy	Optimism	Financial Behaviour
Trial Arm	0.43*** (0.04)	0.18*** (0.04)	0.20*** (0.05)	0.15*** (0.05)	0.13* (0.07)
Positive Caregiver-Child Relationship			0.24*** (0.07)	0.23*** (0.06)	
Emotional/Affectionate Social Support	*0.34*** (0.04)*		0.03 (0.05)	0.23*** (0.05)	
Financial Self-Efficacy					0.32*** (0.09)
Optimism			*-0.00 (0.07)*		0.36*** (0.08)
Measurement Model					
Friendly talk	1 (fixed)				
Special activities	1.004***				
Play games	0.936***				
Ask about day	1.159***				
Help with homework	1.153***				
Ask about plans	0.951***				
Drive or walk child	1.026***				
Talk about friends	0.870***				
Family activities	0.943***				
Attend parent meetings	1.121***				
Listen to you		1 (fixed)			
Help you understand		1.005***			
Give you advice		1.023***			
Confide in him/her		1.047***			
Share private worries		1.063 ***			
Help with personal problem		1.079***			
Understands you		1.041***			
Shows you affection		1.041***			
Makes you feel loved		1.059***			
Hugs you		0.912***			
Have a good time with		1.082***			
Relax with		1.085***			

Do something fun with		1.112***			
Get your mind off		1.112***			
Plan money carefully			1 (fixed)		
Not run out of mony			0.988***		
Hopeful about the future				1 (fixed)	
Focused mind				0.292***	
As good as others				0.903***	
Happy				0.983***	
Enjoyed life				1.079***	
Life been successful				0.634***	
Enough energy				0.448***	
Past-month saving					1 (fixed)
Past-month debt family					0.858***
Past-month debt lender					0.634***
Correlated Item Residuals					
Hopeful about future & As good as others	0.40*** (0.12)				
Focused mind & Enough energy	0.46*** (0.05)				
Helps you understand & Gives you advice	0.60*** (0.06)				
Goodness of Fit					
Financial Behaviour					
Cronbach's α	0.72				
CFI	0.984				
RMSEA	0.051				
SRMR	0.060				
Caregiver-Child Relationship					
Cronbach's α	0.76				
CFI	0.992				
RMSEA	0.059				
SRMR	0.049				
Emo./Affect. Support					
Cronbach's α	0.95				
CFI	0.983				
RMSEA	0.290				
SRMR	0.208				
Financial Self-Efficacy					

Cronbach's α	0.60				
CFI	0.828				
RMSEA	0.140				
SRMR	0.155				
Optimism					
Cronbach's α	0.63				
CFI	0.923				
RMSEA	0.153				
SRMR	0.123				
Full Model					
χ^2	**3157.064*** (df = 804)**				
CFI	**0.976**				
RMSEA	**0.073**				
SRMR	**0.103**				
N	**552**				

*Notes: *p<0.1, **p<0.05, ***p<0.01. Standardised estimates shown, SE in parentheses. Coefficients are based on a DWLS estimator. The table shows results with the best model fit. In a previous model, we have additionally controlled for baseline value of financial behaviour and rural/urban strata. Coefficients of interest remained virtually unchanged, but model fit was poorer for parsimony reasons and baseline controls thus removed for the final model presented in here. Similarly, another model was run with clustered standard errors and coefficients of interest remained similar in magnitude and significance. However, model fit was generally lower (CFI 0.72, RMSEA 0.08, SRMR 0.09) due to the small number of clusters and relatively high number of parameters estimated, which is why the unclustered version is presented in here. Non-directional covariances in the structural model in italics. Item residuals were correlated as informed by inspection of modification indices. Goodness of fit presented for the final full path model. u*